

Message from Chairs

On behalf of the Program Committee, we are pleased to present this Proceedings of the Sixteenth IEEE Symposium on Mass Storage Systems which is being held in cooperation with the Seventh NASA Goddard Space Flight Center Conference on Mass Storage Systems and Technologies.

Information-Based Access to Storage: The Foundation of Information Systems, the theme of this Symposium has its central focus the software infrastructure that is needed to turn archives into information repositories. The development of technology to support information discovery against archived data, caching systems to allow database manipulation of digital objects, and advanced hardware systems to support high-speed access to data are all required. Papers that focus on development of digital libraries of archived data, collection-based persistent archives, and high performance storage systems presented in these Proceedings illustrate these concepts

The meeting sessions have been organized to provide topical information and insights on emerging and future trends in technology. A one day Tutorial, *"Emerging Standards Impacting Storage System Architectures"* is followed by three days of Symposium sessions. We are fortunate to have Dr. Andrew B. White Jr., Director, Delphi Project, Los Alamos National Laboratory to provide the Keynote address, *"High-end Computing and Society"* which provides the context for the continually expanding requirements for petabyte storage solutions. Presentations follow on subjects ranging from Data Management Architecture Components, Storage System Applications, Striping Across Media, Modeling Storage Systems, Performance of Storage Systems, and Database/Archive Integration. A session on Vendor Solutions, a Roundtable on Emerging Middle to High-end Removable Media Products, and an evening presentation of posters complete the sessions. Invited talks are given on the NSIC Magnetic Tape Systems and Technology Roadmap, and on the requirements of NIMA's Very Large Digital Libraries. A Vendor Expo in which participating vendors provide technical information in an informal setting is being held during session breaks and in the evening.

The preparation for this conference and this publication involved dedication and teamwork by the Program Committee whose members are listed on the next page. They diligently reviewed submissions and worked with authors to improve papers and to ensure that they were complete. We are especially grateful to the following individuals whose hard work made all this possible: Sam Coleman, former president of the IEEE MSSTC; P.C. Hariharan, SES, Inc.; Jean-Jacques Bedet, Raytheon STX; and Merritt Jones, MITRE who shepherded the papers. Richard Watson, Lawrence Livermore National Laboratory who organized the Roundtable, Ethan Miller, University of Maryland, Baltimore County who prepared papers for publication, Rodney Van Meter, Quantum Corporation, who shepherded papers and organized the Tutorial. Paul Rutherford and Jena Taylor of ADIC organized the Vendor Expo session in which over 20 vendors are participating. Rochell Bernsdorf and Nancy Jensen of SDSC ably handled the numerous administrative aspects of the meeting throughout its planning and execution.

We are distributing Proceedings on a CD ROM for the first time and would like to extend our appreciation for the support provided by Greg Withee, NOAA which made this possible. Mohan Paturi and Donna Zane of Parity Computing prepared and published these Proceedings enabling us to distribute both hardcopy and CD ROM media at the Symposium.

Ann Kerr, Conference Chair

Reagan Moore, Program Chair

Ben Kobler, Conference Vice-chair

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Keynote Address - March 16th

"High-end Computing and Society"

by Andrew B. White Jr.

**Director
Delphi Project
Los Alamos National Laboratory**

Applications suitable for a Peta(fl)ops computer and exabyte storage systems will extend outside the conventional bounds of science, solving problems which affect lives, property, well-being and security at, potentially, every level of society. Further, these applications demand predictive modeling and simulation at a fidelity, scale, and tempo that are far beyond our current technological ability. Applications in this class include national health security, infrastructure planning and protection, crisis forecasting and management, and global climate and regional assessment. The target of these efforts is to provide planners, policy and decision-makers with the tools and information necessary to better understand the complex, interrelated systems with which they must deal.

Attacking problems at the societal level places significant requirements on the technology as well as the fundamental theory upon which these simulations are based. Robust threat identification (e.g. wildfire, infectious disease) will require not only high-end computing and storage, but also commensurate surveillance and I/O capabilities. Real-time applications will require extraordinary RAS compared to today's scientific computing systems. Verification, validation and quantification of the uncertainty inherent in these simulations will be of paramount importance, as these simulations may very well be a key factor in life and death decisions. Finally, we must understand the decision-making process and embed these tools within it. We must provide the end user, the decision-maker, with information they require and trust, in a format and context, on a time-scale, and in a location which they can use in support of their activities.

More than twenty years ago, Edward Wenk stated the basic problem very succinctly:

"It is clear that decision aptitudes are sharply challenged. The range of alternative is greater. The underlying technical facts are more difficult to comprehend because of their sophistication and specialised jargon, and the consequences of error are more lethal and irreversible. Decision-makers are perplexed by new levels of complexity and hyper-interdependence in our society, accompanied by uncertainty, a heightened pace of social change, and discontinuities in utility of past experience"